

# Idaho Strategic Energy Alliance

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FAQ - 2015



This document is provided as a means to facilitate communication about energy in Idaho. The Idaho Office of Energy Resources does not endorse any political opinions that may be expressed in this document.

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## What is Energy? <sup>1</sup>

**Energy is “the ability to do work.”**

- Energy can be found in a number of different forms. It can be chemical energy, electrical energy, heat (thermal energy), light (radiant energy), mechanical energy, and nuclear energy.

**Energy makes everything happen and can be divided into two types:**

- Stored energy is called potential energy.
- Moving energy is called kinetic energy.
- With a pencil, try this example to know the two types of energy.
  - Put the pencil at the edge of the desk and push it off to the floor. The moving pencil has kinetic energy.
  - Now, pick up the pencil and put it back on the desk. You used your own energy to lift and move the pencil. Moving it higher than the floor adds energy to it. As it rests on the desk, the pencil has potential energy. The higher it is, the further it could fall. That means the pencil has more potential energy.



**Energy can be transformed into another form of energy. However, it cannot be created AND it cannot be destroyed. Energy has always existed in one form or another.**

- Below are some changes in energy from one form to another.
  - Stored energy in flashlight batteries become light energy when the flashlight is turned on.
  - When you talk on the phone, your voice is transformed into electrical energy, which passes over wires (or is transmitted through the air). The phone on the other end changes the electrical energy into sound energy through the speaker.
  - A car uses stored chemical energy in gasoline to move. The engine changes the chemical energy into heat and kinetic energy to power the car.
  - A toaster changes electrical energy into heat and light energy. (If you look into the toaster, you'll see the glowing wires.)
  - A television changes electrical energy into light and sound energy.
  - Boilers convert the heat from natural gas or coal into steam heat which is converted to kinetic energy or used for production heat.

## How much energy is used in Idaho?



### How is energy used in Idaho?

A breakdown of energy use in Idaho is as follows:<sup>2</sup>

1. Heating (non-electric) – 24%
  - Some of the most common sources of heating fuel in Idaho include: natural gas, geothermal energy, and biomass (principally wood).
2. Transportation – 26%
  - All of Idaho's petroleum-based transportation fuels come from out of state because there are no refineries in Idaho. Idaho has fuel ethanol and biodiesel production capacity.
3. Electricity – 50%
  - In a typical year, more than half of Idaho's electricity is generated in-state, primarily from renewable energy sources such as hydroelectricity and wind. The remainder of Idaho's electricity comes primarily from coal-fired power plants and renewable resources located in neighboring states.

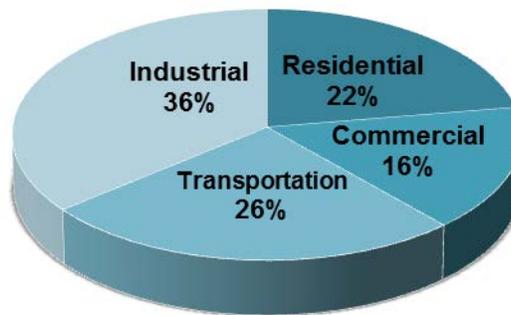
<sup>1</sup> [www.energyquest.ca.gov/story/chapter01.html](http://www.energyquest.ca.gov/story/chapter01.html) The information in this section is used with the permission of the California Energy Commission

<sup>2</sup> [www.eia.gov/state/print.cfm?sid=ID](http://www.eia.gov/state/print.cfm?sid=ID)

We can also look at Idaho energy use by sector:

- Residential use: Space heat, lighting, appliances, etc. – 22% of total Idaho energy use,
- Commercial: Space heat, lighting, appliances, products and services – 16% of total Idaho energy use,
- Industrial: Process and space heat, lighting, agriculture, equipment, products and services, electrical generation – 36% of total Idaho energy use,
- Transportation: private, commercial, industrial, agricultural, and public – 26% of total Idaho energy use.

**Idaho Energy Use by Sector (2012)<sup>3</sup>**



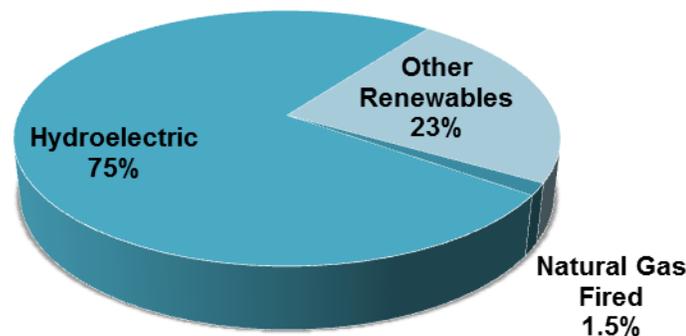
**How much energy do we use?**

- According to the [EIA](#) Idaho uses about 519 trillion BTUs of energy each year. (Generation of 1 kilowatt-hour (kWh) of electricity requires about ten thousand BTUs of thermal energy; one gallon of gasoline contains about 125,000 BTUs).
- Idaho’s total energy consumption is low compared to other states; however, the state’s population is also low. As a result, per capita energy consumption is close to the national average. Idahoans use about 332 million BTUs per person each year, which places Idaho 21st per capita energy use (the national average is 312 million BTUs per capita).

**Where does it come from?**

- Idaho is a net importer of energy. About 35% of the state’s electricity and about 75% of Idaho’s total energy comes from sources outside the state.
- Of the electricity Idaho produces within its borders, roughly three-fourths is from hydro power.
- Almost all of Idaho’s natural gas is imported from the western United States and Canada.

**Source of Idaho Electricity (2012)<sup>4</sup>**



<sup>3</sup> [www.eia.gov/state/?sid=ID#tabs-2](http://www.eia.gov/state/?sid=ID#tabs-2)

<sup>4</sup> [www.eia.gov/state/?sid=ID#tabs-4](http://www.eia.gov/state/?sid=ID#tabs-4)

## Within Idaho

- Idaho is served by two major interstate natural gas pipelines, Gas Transmission Northwest and Williams. These pipelines provide natural gas to Idaho from Canada, and the Williams system has bi-directional capabilities, providing natural gas from the western U.S., as well.
- Idaho is served by two investor-owned natural gas utilities; Avista in northern Idaho, and Intermountain Gas Company in southern Idaho.
- Questar Gas, a natural gas utility based in Salt Lake City, provides retail natural gas-distribution to a portion of Franklin County in southern Idaho.
- A map of the major natural gas pipelines and local gas distribution companies from the Idaho Public Utilities Commission is available here: <http://www.puc.idaho.gov/fileroom/maps/gas.pdf>
- Idaho is served by three investor-owned electric utilities (IOUs) and 28 municipal or rural electric cooperatives utilities.
  - The three IOUs:
    - [Idaho Power](#)
    - [Avista Utilities](#)
    - [Rocky Mountain Power](#)
  - The service areas of the IOUs together serve more than 85% of the electric customers in Idaho, and own generating assets outside the state that provide electricity to serve Idaho customers.
  - The municipal and cooperative utilities deliver electricity that is primarily generated by the Bonneville Power Administration. Many of BPA's generating facilities are located outside the state of Idaho.



Municipal and Cooperative Utilities <sup>5</sup>			
City of Albion	City of Soda Springs	Idaho Falls Power	Northern Lights, Inc.
City of Bonners Ferry	City of Weiser	Inland Power & Light	Raft River Rural Electric Co-op, Inc.
City of Burley	Clearwater Power Company	Kootenai Electric Co-op, Inc.	Riverside Electric
City of Declo	East End	Lost River Electric Co-op, Inc.	Salmon River Electric Co-op
City of Heyburn	Fall River Rural Electric Co-op	Lower Valley Power & Light Co.	South Side Electric
City of Plummer	Farmers Electric	Minidoka	United Electric
City of Rupert	Idaho County Light & Power Co-op	Missoula Electric Co-op	Vigilante Electric Co-op, Inc.

- Most Idaho markets receive petroleum-based fuels from refineries in Montana and Utah via two pipelines, one is owned by ConocoPhillips (Yellowstone Pipeline) and the other by Tesoro (Northwest Product Pipeline).

<sup>5</sup> [www.icua.coop](http://www.icua.coop)

## Energy Prices

### How do prices in Idaho compare to other states?

- Average residential electric rates in Idaho are about 30% less than the national average, while residential natural gas prices are about two-thirds of the national average. The affordability of energy in Idaho contributes to the state's economic competitiveness and is a significant factor in Idaho's affordable living.



### Electricity<sup>6</sup>

Idaho's price of electricity can be broken down into 3 areas (prices as of 2014):

- **Residential:** Idahoans pay an average of 9.16 cents/kWh, compared to the national average of 12.26 cents/kWh.
- **Commercial:** Idaho's average rate is 7.63 cents/kWh, compared to the national average of 10.68 cents/kWh.
- **Industrial:** Idaho businesses pay an average of 5.73 cents/kWh, compared to the national average of 6.99 cents/kWh.

### Natural Gas (U.S. Energy Information Administration data)

- Idaho residents pay an average of \$8.82/thousand cubic ft., compared to the national average of \$10.70/thousand cubic ft. (prices as of 2014)
- Generally, commercial and industrial natural gas customers in Idaho enjoy a similar price advantage when compared to the rest of the U.S.

### Gasoline

- Gas prices can and do change regularly and fluctuate across the country, For example, during the week of April 29, 2014, Idahoans paid an average of \$3.47/gallon, compared to the national average of \$3.65/gallon. Idaho's gasoline taxes are 5 cents per gallon lower than the 30 cent national average. For up to date information, visit [Idaho Gas Prices](#).

### How are electricity and natural gas prices set in Idaho?

Electricity and natural gas rates are set by the Idaho Public Utilities Commission for investor owned utilities, by city councils for municipal systems, and by the board of directors for cooperative systems.

The Public Utilities Commission establishes retail rates on a cost-of-service basis, which are designed to allow a utility an opportunity to recover what each state regulatory commission deems to be the utility's reasonable costs of providing services, including recovery of interest expense and a fair opportunity to earn a reasonable return on its equity investments<sup>7</sup>. In addition to return on investment, a utility's cost of service also generally reflects a representative level of prudent expenses, including energy costs, operation and maintenance expense, depreciation and amortization expense, and income and other tax expense, reduced by wholesale electricity sales and other revenue. The price of electricity differs state by state and even utility by utility, as the cost structure varies for each utility depending on the generation resources it relies on and the age of its infrastructure, including legacy hydro and coal-fired power plants. New power plants and power lines needed to serve growing energy demand will tend to move prices upward. National and regional factors such as environmental policies or wholesale markets will also impact the cost of electricity.

<sup>6</sup> U.S. Energy Information Administration data for March 2014 – see [www.eia.gov/state/state-energy-profiles-data.cfm?sid=ID#Consumption](http://www.eia.gov/state/state-energy-profiles-data.cfm?sid=ID#Consumption)

<sup>7</sup> Public utility systems generally base their rates on a cost of service analysis that considers the same factors as considered by the Idaho PUC (minus the return on equity investment).

Natural gas prices are also influenced by national and regional factors, and international developments play a role, as well. Weather, transmission capacity, state and federal regulation, and supply source adequacy and reliability all influence natural gas pricing. The United States and Canada have recently added substantial new natural gas supply resources by unlocking the mid-continental shale gas formations. Where ten years ago, domestic natural gas supply was said to last around 30 years, known deliverable North American gas reserves are now ample for the next 200 years.

### What causes electricity rate increases?



The largest driver behind higher electric rates is increased customer demand for electricity in the face of rising costs to provide that electricity. Electricity consumption is rising despite today's modern appliances using less energy than their older counterparts. Technological advances have created many new uses for electricity. The federal Energy Information Administration reports that consumer demand for electricity is projected to grow 1.5 percent each year through 2030 and that overall electricity consumption will increase by 45 percent by 2030. Many utilities also face increasing environmental compliance costs.

Idaho's utilities are investing in new generation and transmission in the face of growing population and demand. Hydroelectric plants are going through an expensive relicensing process and are in need of significant capital improvement investment while out-of-state coal sources require environmental upgrades.

### Why can't they just say no to rate increases?

For 100 years, public utility regulation on investor owned utilities has been based on the following regulatory compact between utilities and regulators. Regulated utilities agree to invest in the generation, transmission, and distribution necessary to adequately and reliably serve all customers in their assigned territories. In return for that promise to serve, utilities are guaranteed recovery of their *prudently* incurred expense along with an opportunity to earn a reasonable rate of return.

In setting rates, the commission must consider the needs of *both* the utility and its customers. When a utility makes an application for a rate increase, the Commission is required to consider it. Commission staff carefully reviews the application to determine if the company's increased expenditures were necessary to serve customers and, if necessary, were those expenses prudently incurred. Customers are not required to pay for unnecessary or imprudent expense.

Public power entities are not-for-profit utilities that are required to cover their operation and maintenance costs, including any investment in infrastructure necessary to serve their customers electric needs. These utilities operate off of electric rate revenue, not taxes. These utilities are required to plan for and provide current and future electric needs of its customers. The city council and board of directors oversee programs and infrastructure development, setting the policy and the direction of the utility. Those costs, along with operation and maintenance costs, must be recovered in electric rates.

It's not in customers' best interest to have utilities that do not have the generation, transmission, and distribution infrastructure to be able to provide safe, adequate, and reliable electric service. This requires walking a fine line in balancing the interest of both customers and utilities as relates to setting electric rates.

### Why have Idaho’s natural gas utilities been filing for rate decreases for the past few years?

While natural gas demand continues to grow each year, including use in electrical generation, the aforementioned increase in North American natural gas supply has resulted in a reduction of natural gas commodity pricing that is passed through to all users. Additionally, Idaho’s natural gas utilities have made great gains in operating efficiencies through technology, automated meter-reading and organizational right-sizing.

### Why should I have to pay for conservation programs that don’t benefit me?

If the Commission, council, or board believed that an energy efficiency program or a demand reduction program did not benefit all customers, it would not approve it. The Commission or public power utility performs a number of cost-effectiveness tests on each program to determine if the expenses associated with the program are not greater than the benefits to all customers. Although a customer may not volunteer to participate in an energy efficiency or demand-reduction program, all customers benefit from the expense that the utility does not incur acquiring the energy from other, more costly resources.

### Are electric utilities required to buy wind power?



The federal Public Utility Regulatory Policies Act of 1978 (PURPA) requires regulated utilities to buy power from qualifying, independent small-power producers. In recent years, there has been a rapid increase in wind development, due partly to federal incentives to renewable developers. The Commission has taken steps to ensure that customers do not pay more for wind or other PURPA resources than they would have had the utility had to generate the power itself or acquire it from another source. The Commission now requires projects that are intermittent (not continuously available, such as wind and solar) to negotiate with the purchasing utility. The rate paid to the project is based on the individual generation characteristics of each project and its ability to deliver energy when the utility is most in need.

### How can I lower my utility bills?

Please see our answer to: “Where can I get tips on how to use less energy?”

## Environment

### How much coal, natural gas, or petroleum is used to generate a kilowatt-hour of electricity?

The exact amount used will depend on variables such as the heat content of the fuel and the efficiency of the energy conversion, but on average the amount of fuel used to generate one kilowatt-hour (kWh) of electricity is:

- Coal = 0.00052 Short Tons or 1.03 Pounds
- Natural Gas = 0.01003 Mcf (1,000 cubic feet)
- Residual Fuel Oil = 0.0016 Barrels or 0.067 Gallons.

### How much carbon dioxide (CO<sub>2</sub>) is produced by the combustion of different fuels?

You can calculate the amount of CO<sub>2</sub> produced per kWh for specific fuels and specific types of generators by multiplying the [CO<sub>2</sub> emissions factor for the fuel](#) (in pounds of CO<sub>2</sub> per million Btu) by the [heat rate](#) of a generator (in millions of Btu per kWh generated).

For example, here is the number of pounds of CO<sub>2</sub> produced by a steam-electric generator consuming different fuels and the [average heat rates for steam-electric generators in 2014](#):

Fuel	Lbs of CO <sub>2</sub> /Million Btu	Heat Rate (Btu/kWh)	Lbs CO <sub>2</sub> /kWh
Coal			
Bituminous	205.300	10,107	2.08
Sub-bituminous	212.700	10,107	2.16
Lignite	215.400	10,107	2.18
Natural gas	117.080	10,416	1.22
Distillate Oil (No. 2)	161.386	10,416	1.68
Residual Oil (No. 6)	173.906	10,416	1.81

### Where can I get tips on how to use less energy?

For tips from national organizations, please see:

- o [US Department of Energy's Energy Savers](#)

For tips from Idaho organizations, please see:

- o [ISEA Primer Booklet](#): Pages 46–49
- o [ISEA Energy Tips](#)
- o [Avista Utilities' Energy Saving Tips](#)
- o [Idaho Power's 30 Simple Things You Can do to Save Energy](#)
- o [Rocky Mountain Power's Efficiency Programs & Incentives](#)
- o [Rocky Mountain Power's Savings Calculator](#)
- o [Intermountain Gas Company's Conservation Tips](#)



### What are Smart Meters?

“Smart meter” usually refers to an electric digital meter that keeps detailed statistics on electricity usage. Additionally, a lot of smart meters can also perform “telemetry,” in which they interface remotely with the utility and avoid the need for a person to come out and read the meter. A meter with telemetry can also provide instant reporting of power outages and other issues, which enables the utility to give a quicker response. A utility can also use an energy smart meter network to monitor power for balancing energy requirements during peak demand periods, such as hot summer days in areas where people use air conditioning.

For customers, a smart meter can offer detailed breakdowns of the energy they consume, which enables them to see energy usage patterns. Using this information, people can keep a check on their energy usage to save money and to reduce the overall power demand.

### Do I have one?

- **Intermountain Gas Company**

Intermountain has employed Automated Meter Reading (AMR) since 2003. Intermountain was the first major utility in Idaho to adopt this technology, installing over 225,000 AMR units at all core market customers in one summer. Intermountain now has over 320,000 customers, and virtually 100% of them are equipped with this system. Intermountain is evaluating the deployment of the next generation of natural gas ‘smart meters.’

- **Idaho Power**

[Idaho Power](#) has deployed Advanced Metering Infrastructure (AMI) technology 'smart meters' to help customers manage their energy use. Smart meters also help utilities serve their customers better through more accurate meter reading and better management of outages.

The smart meter exchange program began in 2009. It was completed in 2011. Idaho Power contractor, TruCheck, replaced traditional electric meters with more advanced smart meters throughout its 24,000-square-mile service territory in Idaho and Oregon. Customers in Emmett and McCall received their smart meters in 2004 during a pilot program. By the end of the three-year project, Idaho Power installed more than 500,000 meters.

- **Avista**

Currently, Avista has upgraded about 13,000 electric and 5,000 natural gas meters. These customers are in Pullman, Washington, another area served by Avista. However, Avista may upgrade its Northern Idaho customers in the near future.

- **Rocky Mountain Power**

Rocky Mountain Power is not upgrading its units. Instead, it is studying several smart grid technologies that appear to offer the most benefits to customers and are most easily added to the existing electrical system:

- advanced metering systems;
- systems that provide information to devices that customers own to control energy use;
- improved outage management systems; and
- advanced technologies to increase the efficiency and reliability of the regional transmission system and local distribution systems.

Rocky Mountain is paying close attention to smart grid pilot projects happening around the country.

- **Municipal and Cooperative Systems**

More than 95% of meters in municipal and cooperative systems are either AMI or AMR. AMI installations account for nearly 75% of meters served by public power systems. Cooperative systems primarily use broadband instead of power line carriers due to the rural, low-density nature of their service territory. Municipal systems largely use mesh systems due to their tight, high-density, service territories.



## How can I learn how to use one?

Here is a useful [link](#) on how to read your Smart Meter.

## Energy Education and Training

- Students and kids can find information on energy through the youth-friendly resources at the [U.S. Department of Energy](#) and the [U.S. Energy Information Administration](#).
- More information:
  - [Energy Efficiency & Renewable Energy: Energy Basics](#)
  - [Idaho Office of Energy Resources](#)
  - [EERE Energy Education and Workforce Development](#)
  - [Wind Powering America](#)
  - [Solar Energy Technologies Program](#)

## More Information

### How do I order a copy of the Idaho Energy Primer 2015?

The ISEA has a downloadable PDF version of the booklet on their [website](#), or you may call the Idaho Office of Energy Resources at 208-332-1660.

### What other web sites have useful energy data?

- U.S. Department of Energy: [www.energy.gov](http://www.energy.gov)
  - For Prices and Trends: [www.energy.gov/prices-trends](http://www.energy.gov/prices-trends)
- U.S. Department of Energy Office of Energy Efficiency & Renewable Energy: [www.energy.gov/eere/office-energy-efficiency-renewable-energy](http://www.energy.gov/eere/office-energy-efficiency-renewable-energy)
- U.S. Energy Information Administration: [www.eia.gov](http://www.eia.gov)
- Fuel Data: [www.fueleconomy.gov](http://www.fueleconomy.gov)
- Idaho Governor's Office of Energy Resources: <http://www.energy.idaho.gov/>
- Idaho National Laboratory: <https://inlportal.inl.gov/portal/server.pt/community/home/255>
- Idaho Public Utilities Commission: [www.puc.idaho.gov](http://www.puc.idaho.gov)

### My vehicle runs on alternative fuel. Where can I find a fueling station in Idaho?

- Look up the locations of Idaho's alternative refueling stations.
  - [Biodiesel](#) (2 Public, 2 Private)
  - [Compressed Natural Gas](#) (2 Public, 8 Private)
  - [Electricity](#) (9 Public, 3 Private)
  - [Ethanol](#) (6 Public, 3 Private)
  - [Hydrogen](#) (0 Public, 0 Private)
  - [Liquefied Natural Gas](#) (6 Public, 0 Private)
  - [Propane](#) (25 Public, 0 Private)
  - For a nationwide search, visit the [Alternative Fueling Station Locator](#).
- Fill up with Natural Gas at home:  
Intermountain Gas will install a separate gas meter to supply natural gas for your home filling station. For more information see their [website](#).

